

Complies with the machinery directives 2006/42/EC

4 better lifting



NB: Please ensure that the safety instructions have been fully read and understood before initial use of the INOX-ABA weld-on lifting point. Failure to do so may result in serious injuries and/or material damage and eliminates manufacturers warranty.

User Instructions - Part 1

Safety instructions

This safety instruction/declaration of the manufacturer must be kept on file for the lifetime of the product.

ATTENTION: Please inspect all lifting points prior to use. Damage, incorrect assembly or improper use can result in serious injuries and/or material damage.

EC-Declaration of the manufacturer

According to the Machinery Directive 2006/42/EC, annex II A and amendments.

We hereby declare that the equipment sold by us because of its design and construction, as mentioned below, corresponds to the appropriate, basic requirements of safety and health of the corresponding EC-Machinery Directive 2006/42/EC as well as to the below mentioned harmonised and national norms as well as technical specifications.

In case of any modification of the equipment, not being agreed upon with us, this declaration becomes invalid.

Designation of the equipment:

Type: **INOX-ABA weld-on lifting point**

Manufacturer's mark:

Drawings (iges, dxf and step), product information and other support material can be downloaded from www.rud.com.au.



EC-Declaration of conformity

According to the EC-Machinery Directive 2006/42/EC, annex II A and amendments

Manufacturer: **RUD Ketten**
Rieger & Dietz GmbH u. Co. KG
Friedensinsel
73432 Aalen

We hereby declare that the equipment sold by us because of its design and construction, as mentioned below, corresponds to the appropriate, basic requirements of safety and health of the corresponding EC-Machinery Directive 2006/42/EC as well as to the below mentioned harmonized and national norms as well as technical specifications. In case of any modification of the equipment, not being agreed upon with us, this declaration becomes invalid.

Product name: Lifting point for welding INOX

The following harmonized norms were applied:

DIN EN 1677-1 : 2009-03 DIN EN ISO 12100 : 2011-03

The following national norms and technical specifications were applied:

DGUV-R 109-017 : 2020-12

Authorized person for the configuration of the declaration documents:
Michael Betzler, RUD Ketten, 73432 Aalen

Aalen, den 25.08.2022

Hermann Kolb, Breichsleitung MA

Name, function and signature of the responsible person

User Instructions - Part 2



Before initial usage of the RUD weld-on lifting point INOX-ABA, please carefully read the safety instructions. Make sure that you have understood all subject matters. Non-observance can lead to serious personal injuries and material damage and eliminates warranty.

1. Safety Instructions



ATTENTION

Wrong assembled or damaged INOX-ABA as well as improper use can lead to injuries of persons and damage of objects when load drops. Please inspect all INOX-ABA before each use.

- Remove all body parts (fingers, hands, arms, etc.) out of the hazard area (danger of crushing or squeezing) during the lifting process.
- INOX-ABA must only be used by instructed and competent persons considering DGUV-rules 109-017 and outside Germany noticing the country specific statutory regulations.
- Do not exceed the working load limit (WLL) indicated on the lift point.
- No technical alterations must be implemented on the INOX-ABA.
- Do not stand under a suspended load or be in the danger zone/fall zone when conducting a lift.
- Shock loading and strong impact should be prevented.
- Always ensure a stable position of the load when lifting. Swinging must be prevented.
- Damaged or worn INOX-ABA must be removed from service immediately.

2. Intended Use

- INOX-ABA must only be attached to a load or used as load accepting means.
- Their usage is intended to be used as lifting means.
- INOX-ABA can also be used as lashing points for fixing lashing means.
- Loading from any side is permitted.
- INOX-ABA must not be hot dip galvanized.
- INOX-ABA must only be used in the here described operation/user instructions.

3. Material Properties

The ferrite-austenite structure of 1.4462 shows excellent corrosion resistance in acidic environments. In particular in phosphoric and organic acids, also in chlorine-containing media. The corrosion resistance is higher compared to the standard austenites (e.g. 1.4301, 1.4541, 1.4404). Due to the duplex structure of the microstructure, 1.4462 is usually superior to the austenitic steels, as it is insensitive to intergranular corrosion and particularly resistant to stress corrosion cracking, pitting and crevice corrosion.

1.4462 is resistant to seawater and media containing H₂S. RUD INOX-ABA can be used in a wide range of applications, such as in the construction industry, the chemical industry, the petroleum industry, the food industry (moderate resistance to lactic acid), in mechanical engineering, e.g. as a Flue Gas Desulfurization (FGD) component, in desalination plants, Offshore applications and in shipbuilding.

The material 1.4462 is also suitable for applications in nuclear technology, as far as the nuclear rules or object-related specifications allow the use.

4. Assembly and Instruction Manual



NOTE

RUD guarantees the overall conformity of the INOX-ABA only after complete and correct implementation of the assembly and welding specifications.

4.1 General information

- Capability of temperature usage: INOX-ABA may be used in the temperature range from -40°C to 250°C. If necessary, take into account temperature-related reductions in the load-bearing capacity of other connection components used.



NOTE

After use above the maximum specified temperature, further use is no longer permitted and the lifting point must be replaced. The quality / safety of the lifting point is then no longer guaranteed.



NOTE

The material 1.4462 tends to get brittle at 475°C, therefore the use of this material is limited to temperatures below 350°C.

Exception: INOX-ABA can be stress-relieved one-time in an unloaded condition, together with the load (e.g. welded construction). Temperature < 580°C / 1050°F (one hour maximum).

- The reuse of cut-off INOX-ABAs is not permitted
- INOX-ABA must not be used with aggressive chemicals such as acids, alkaline solutions and their vapours.
- Please mark mounting position of INOX-ABA with a coloured contrast paint for better visibility.

4.2 Notes for assembly

- The material construction to which the lifting point will be attached should be of adequate strength to withstand forces during lifting without deformation. The weld-on material must be suitable for welding and the contact areas must be free from impurities, oil, colour, etc. Preheat the structure according to AS 1554 (if required).

The material of the lifting point for welding is: 1.4462

- The position of the lifting points must be carried out in such a way that unintended movement like turning or flipping will be avoided.
- **For single leg lifts** - the lifting point should be vertically above the centre of gravity of the load.
- **For two leg lifts** - the lifting points must be equidistant to/or above the centre of gravity of the load.
- **For three and four leg lifts** - the lifting points should be arranged symmetrically around the centre of gravity in the same plane.
- Position weld-on lifting points INOX-ABA into the load force direction (compare Abb./Pic. 5 permissible WLL at different loading directions).
- Symmetry of loading: Determine the necessary WLL of each INOX-ABA for a symmetrical or an unsymmetrical load by using the following physical calculation formula:

$$W_{LL} = \frac{G}{n \times \cos \beta}$$

W_{LL} = required WLL (kg) of lifting point / leg
 G = load weight (kg)
 n = number of load bearing legs
 β = inclination angle of single leg

• Included angle is the angle between the sling legs.

Number of load bearing strands:

	Symmetric	Asymmetric
Two leg	2	1
Three/Four Leg	2	1

Table 1: Load bearing legs (Compared to Table 5)

• Check the final assembly before each use. (see chapter 5 Inspection / repair / disposal).

NOTE - With asymmetrical loads, the WLL of each lifting point must be the same as weight of the load. For special applications, please consult the RUD Engineering team.

4.3 Notes for welding

Observe the following when preparing for welding:

- Clean the welding areas.
- Match the heat guidance during welding to the component geometry. A line energy of 1-3 kJ/mm is recommended.
- Limit interpass temperatures between 120 and 250°C.
- Avoid rapid cooling of the weld.
- For better austenite formation, it may be necessary to heat the workpiece to approx. 100°-120°C.
- The material can be welded with short-spray or impulse arc. Pulse technique is recommended.

4.4 Procedure for welding

Welding should only be carried out according to ISO 9606-1, AS 1554 or AWS Standards by an authorised welder.



NOTE

Weld all seams in the same temperature.

Procedure:

1. Tack provisionally, resp. start welding in the middle of the plate.
2. Before the closure weld is carried out, make sure that the bottom and all interlayers are cleaned carefully. Remove all visible flaw spots of the root and at the interlayers.
3. Weld the fillet weld circumferentially and without interruption at the base plate of the weld-on point.



NOTE

To avoid possible crevice corrosion, please weld the lifting point circumferentially. Please observe the current DIBt technical approval Z-30.3-6, paragraph 2.1.6.2, 2.1.6.3 and 2.1.6.4.



NOTE

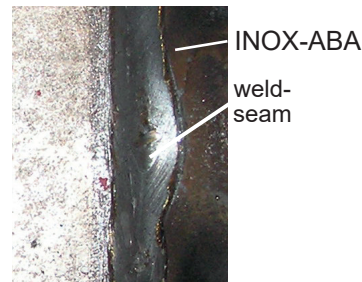
Due to the (forged) shape of the INOX-ABA (sizes 0.8 t, 1.6 t and 2.7 t) there will be a weld-seam changeover in the marked area (see Pic. 1 A and B). This has no impact on the strength of the construction part.

4. INOX-ABA is to be welded and inspected after welding by a competent person. (see chapter 5 Inspection / repair / disposal).

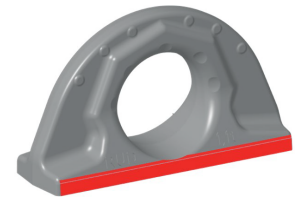


NOTE

By the position of the weld-seam (Fillet weld continuous) the following requirements will be observed: For DIN 18800 steel construction required in outdoor conditions or when strong corrosion is expected, weld seams must be carried out as continuous fillet weld seams.



Picture 1: A: Weld-seam



B: Area of the weld-seam-changeover

4.5 User Instructions

After welding an initial inspection shall be conducted on the weld (refer AS1554 for guidance). During use, annual inspections or sooner if conditions dictate should be undertaken by a competent person examining the continued suitability. Also inspect after damage and special occurrences.



ATTENTION

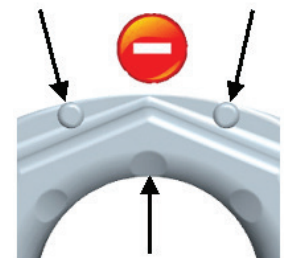
Wrong positioned or damaged INOX-ABA as well as improper use can lead to injuries of persons and damage of the objects. Please check all INOX-ABA carefully before every usage.

• Please inspect the wear indicator markings of the INOX-ABA carefully before each use (see Pic. 2):



No wear

Wear indicators visible



Use prohibited

Picture 2: Wear Indicators

- Please note that the lifting means must be free moveable within the INOX-ABA. When lifting means (chain slings) are hinged or unhinged, no pinching, shearing or joint spots must occur during the handling.
- Avoid damage of lifting means resulting from sharp edges.
- If the INOX-ABA are used exclusively for lashing, the value of the working load limit is doubled: $LC = 2 \times WLL$.



NOTE

If the INOX-ABA is/was used as a lashing point, with a force higher than the WLL, it must not be used as a lifting point afterwards.



NOTE

If the INOX-ABA is/was used as a lashing point, up to the WLL only, it can still be used afterwards as a lifting point.

It is best practice for lifting points and lashing points to be separate designated points.

PLEASE NOTE: The INOX-ABA is to be welded and inspected after welding by a competent person.

5 Inspection / repair / disposal

5.1 Hints for periodical inspections

The operator must determine and specify the nature and scope of the required tests as well as the periods of repeating tests by means of a risk assessment (see sections 5.2 and 5.3). The continuing suitability of the lifting point must be checked at least annually by a competent person.

Depending on the usage conditions, e.g. frequent usage, increased wear or corrosion, it might be necessary to check in shorter periods than one year.

The inspection must be carried out after accidents and special incidents.

5.2 Test criteria for the regular visual inspection by the user

- The lifting point should be complete.
- The working load limit and manufacturers stamp should be clearly visible.
- Deformation of the component parts such as body and load ring.
- Mechanical damage, such as notches, particularly in high stress areas.
- Wear should be no more than 10% of cross sectional diameter (see picture 2, wear indicator marks).
- Evidence of corrosion.
- Evidence of cracks.
- Cracks or other damages to the welding.
- Further tests may be necessary, depending on the results of the risk assessment (e.g. testing for cracks on load-bearing parts / cracks or other damage to the weld).

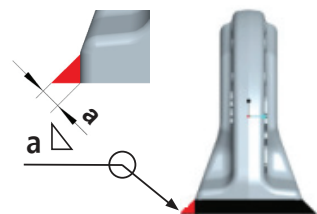
5.3 Disposal

Dispose worn out components / attachments or packaging according to the local waste removal requirements.

6 Tables

	Fillet Weld Throat Size	Leg Length (mm)	Weld Length (mm)	Volume (cm ³)
INOX-ABA 0.8 t	a = 3	5	177	1.593
INOX-ABA 1.6 t	a = 4	6	251	4.016
INOX-ABA 3.2 t	a = 6	9	344	12.38

Table 2: Weld Seam



Picture 3: Welding Seam position



NOTE

Heat the workpiece to approx. 100°C - 120°C for better austenite formation.



NOTE

In welding procedures 111 and 136, welding consumables with basic character may have larger approval scopes.

MILD STEEL / LOW ALLOYED STEEL	
MAG 135	DIN EN ISO 14343: SG 22 9 3NL material number 1.4462
WIG 141	DIN EN ISO 14343: WSG 22 9 3NL material number 1.4462
Electrode 111	DIN EN ISO 3581: E 22 9 3 L material number 1.4462
Cored wire 136, 138	DIN EN ISO 17633: T 22 9 3 L material number 1.4462

Table 3: Welding procedure and Welding filler metals

The INOX-ABA can be welded to these base materials:	
on austenitic-ferritic steels	1.4417; 1.4462 (DIN EN ISA 10088 Teil 2 und Teil 3)
on stainless steels	1.4301; 1.4404; 1.4435; 1.4541; 1.4550; 1.4571
on general structural steels (EN 10025)	S235; S275; S355
to high-temperature structural steels	16Mo3
Additional welding instructions:	
Shielding gases	DIN EN ISO 14175: M1.2, I.1 **
Welding positions	PA, PB, PC, PF **
Weld metal untreated	Minimum values at 20°C (actual values are higher. Actual values can be taken from the approval data sheets)
Yield strength $R_{p0.2}$	480 MPa
Ultimate tensile strength R_m	680 MPa
Elongation at fracture A_5	25%
Notched bar impact energy A_v (ISO V at -60°C/>32J)	40 J



NOTE
Observe the respective processing instructions for the welding procedures and filler materials as well as the other welding instructions.



NOTE
The actual material characteristics of the material batch to be processed are always to be taken from 3.1 or 3.2 acceptance test certificates according to DIN EN 10204.

** The scope of approval of the welding filler material used can be taken from the respective valid regulations (e.g. DIBt Z-30-3.6) and the valid approvals (e.g. VDTÜV, DB).

Table 4: Welding information

Type	Single Leg		2, 3 or 4 Legs		
	F ¹	F ²	60°	90°	120°
INOX-ABA 0.8 t	3.0	0.8	1.4	1.1	0.8
INOX-ABA 1.6 t	5.0	1.6	2.8	2.3	1.6
INOX-ABA 3.2 t	7.5	2.7	4.7	3.8	2.7

Table 5: WLL Overview

Type	WLL (t)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	T (mm)	Weight (kg/pc.)	Ref. No.
INOX-ABA 0.8 t	0.8	22	12	70	32	12	50	38	0.2	7912396
INOX-ABA 1.6 t	1.6	30	16	100	35	16	57	41.5	0.45	7912397
INOX-ABA 3.2 t	2.7	41	23	137	50	21	80	59	1.1	7912398

Table 6: Dimensioning

Subject to technical alterations

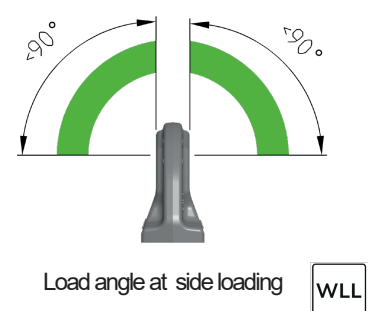
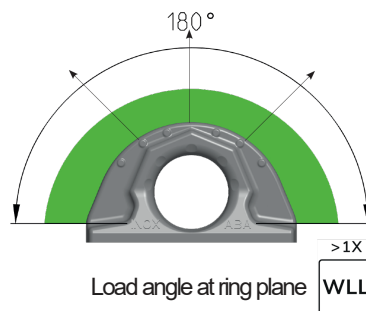
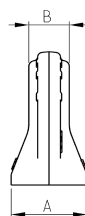
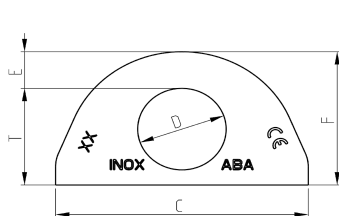


Abb./Pic4: Dimensioning

Abb./Pic5: Permitted loading directions